IN THE CLAIMS:

1. (Currently Amended) A receiver for ~~processing~~ receiving an optical signal carrying a sequence of data thereon, comprising:

a photo-detector connected to an optical path, carrying said optical signal, for converting said optical signal to an electrical signal having non-Gaussian noise therein; and

an equalizer for removing intersymbol interference and said non-Gaussian noise from said electrical signal, said equalizer having a plurality of coefficients configured to be updated based upon a least-mean $2N^{th}$-order (LMN) algorithm, where N is greater than one.

2. (Original) The receiver of claim 1, further comprising a controller to update said coefficients based upon a least-mean $2N^{th}$-order (LMN) algorithm, where N is greater than one.

3. (Original) The receiver of claim 2, wherein said equalizer is a finite impulse response filter configured to produce a first output signal responsive to said electrical signal, said first output signal being representative of a sum of the associated electrical signal plus a weighted sum of previous ones of the electrical signal, wherein the previous signals are weighted by said coefficients.

4. (Original) The receiver of claim 3, further comprising:

a slicer to produce a predicted signal for each first output signal received from the finite impulse response filter;

a subtractor to produce an error signal proportional to the difference between said first output signal and a corresponding predicted signal or training signal; and

a controller configured to update said coefficients responsive to the error signal.

5. (Original) The receiver of claim 4, wherein said slicer is configured to produce the predicted signal by adaptively determining a slicing threshold.

6. (Original) The receiver of claim 4, wherein said equalizer is a feed forward equalizer and said controller is configured to update a set of said coefficients $\vec{c}(k+1)$ at a time (k+1) as $\vec{c}(k)+\beta N[e(k)]^{2N-1}\vec{u}(k)$, wherein β is a preset step size, $\vec{c}(k)$ and $e(k)$ are respective set of

coefficients and error signals at a time k, and $\vec{u}(k)$ is an input signal at the time k.

7. (Original) The receiver of claim 1, wherein the equalizer is a digital filter.

8. (Original) The receiver of claim 2, wherein the equalizer is an analog filter.

9. (Withdrawn) The receiver of claim 3, further comprising:

a first subtractor to produce a second output signal, said second output signal being a sum of one of the first output signals and a corresponding feedback signal;

a slicer to produce a predicted signal in response to each second output signal;

a second subtractor to produce an error signal representing a difference between the second output signal and a corresponding training signal or predicted signal;

a feedback filter to produce the feedback signal in response to corresponding ones of the predicted or training signals, the feedback signal being a weighted sum of the predicted or training signal, wherein weights in the sum being characteristics of the filter; and

a controller to update the weights in response to the error signal, the controller configured to perform the updates based upon a least-mean $2N^{th}$-order (LMN) algorithm where N is greater than one.

10. (Withdrawn) The receiver of claim 9, wherein said equalizer is a decision feedback equalizer and said controller is configured to update a set of the weights $\vec{w}(k+1)$ at a time (k+1) as $\vec{w}(k)+\beta N[e(k)]^{2N-1}\vec{r}(k)$, wherein β is a preset step size, $\vec{w}(k)$ and $e(k)$ are respective sets of weight and error signals at a time k, and $\vec{r}^T(k)=[\vec{u}(k),-\vec{a}(k)]$, where $\vec{u}(k)$ is an input signal at the time k, and $\vec{a}(k)$ is a predicted or training signal at the time k.

11. (Currently Amended) A receiver for receiving ~~processing~~ an optical signal carrying a sequence of data thereon, comprising:

a photo-detector connected to said receiver for converting said optical signal to an electrical signal having non-Gaussian noise therein;

an equalizer for removing intersymbol interference and said non-Gaussian noise from said

electrical signal;

a slicer configured to track variance of said electrical signal and dynamically adjust a slicing threshold based on a history of said variance to maintain an optimum slicer threshold to produce a predicted signal in response to each input signal. ~~to produce a predicted signal in response to each input signal based upon a slicing threshold, wherein said slicing threshold is varied based upon a signal distribution of said electrical signal; and~~

~~a threshold control algorithm to track said signal distribution of said electrical signal and adjust said slicing threshold for a reduced bit error rate of said predicted signal.~~

12. (Cancelled)

13. (Previously Presented) The receiver of claim 11, wherein said threshold control algorithm accumulates said signal distribution information within a window of finite duration to allow tracking of slowly varying non-stationary channels.

14. (Currently Amended) A method for receiving ~~processing~~ an optical signal, comprising ~~the steps of~~:

converting said optical signal to an electrical signal having non-Gaussian noise therein;

removing intersymbol interference and said non-Gaussian noise from said electrical signal using an equalizer, wherein said equalizer is configured by ~~has~~ a plurality of coefficients; and

updating said plurality of coefficients based upon a least-mean $2N^{th}$-order (LMN) algorithm where N is greater than one.

15. (Original) The method of claim 14, wherein said equalizer is a finite impulse response filter that is further configured to produce a first output signal responsive to said electrical signal, said first output signal being representative of a sum of the associated electrical signal plus a weighted sum of previous ones of the electrical signal, wherein the previous signals are weighted by said coefficients.

16. (Currently Amended) The method of claim 15, further comprising the steps of:

producing a predicted signal for each first output signal received from the finite impulse response filter;

producing an error signal proportional to the difference between said first output signal and a corresponding one of the predicted signals ~~signal~~ or a corresponding training signal; and

updating said coefficients responsive to the error signal.

17. (Original) The method of claim 16, further comprising the step of updating a set of the coefficients $\vec{c}(k+1)$ at a time (k+1) as $\vec{c}(k)+\beta N[e(k)]^{2N-1}\vec{u}(k)$, wherein β is a preset step size, $\vec{c}(k)$ and $e(k)$ are respective set of coefficients and error signals at a time k, and $\vec{u}(k)$ is an input signal at the time k.

18. (Withdrawn—Currently Amended) The method of claim 15, further comprising the steps of:

producing a second output signal, said second output signal being a sum of one of the first output signals and a corresponding feedback signal;

producing a predicted signal in response to each second output signal;

for a particular one of said second output signals, producing an error signal representing a difference between ~~the~~ a particular one of said second output signals ~~signal~~ and a corresponding training signal or predicted signal;

producing the feedback signal in response to corresponding ones of the predicted or training signals, the feedback signal being a weighted sum of the predicted or training signal, wherein weights in the sum being characteristics of the filter; and

updating the weights in response to the error signal, the controller configured to perform the updates based upon a least-mean $2N^{th}$-order (LMN) algorithm where N is greater than one.

19. (Withdrawn) The method of claim 18, further comprising the step of updating a set of the weights $\vec{w}(k+1)$ at a time (k+1) as $\vec{w}(k)+\beta N[e(k)]^{2N-1}\vec{r}(k)$, wherein β is a preset step size, $\vec{w}(k)$ and $e(k)$ are respective sets of weight and error signals at a time k, and $\vec{r}^T(k)=[\vec{u}(k),-\vec{a}(k)]$, where $\vec{u}(k)$ is an input signal at the time k, and $\vec{a}(k)$ is a predicted or training signal at the time k.

20. (Currently Amended) A method for processing an optical signal, comprising the steps of:

converting said optical signal to an electrical signal having non-Gaussian noise therein;

removing intersymbol interference and said non-Gaussian noise from said electrical signal;

producing a predicted signal in response to each input signal based upon a slicing threshold;

dynamically varying said slicing threshold based upon a ~~signal distribution~~ variance of said electrical signal; and

tracking said ~~signal distribution of said electrical signal~~ variance and adjusting said slicing threshold to reduce ~~for~~ a ~~reduce~~ bit error rate of said predicted signal.

21. (Cancelled)

22. (Previously Presented) The method of claim 20, further comprising the steps of accumulating said signal distribution information within a window of finite duration to allow tracking of slowly varying non-stationary channels.

23. (New) The receiver of claim 1, wherein said non-Gaussian noise is substantially described by a first component linearly proportional to a noise distribution in said optical signal and a second component proportional to the square of said noise distribution.

24. (New) The receiver of claim 11, wherein said non-Gaussian noise is substantially described by a first component linearly proportional to a noise distribution in said optical signal and a second component proportional to the square of said noise distribution.

25. (New) The method of claim 14, wherein said non-Gaussian noise is substantially described by a first component linearly proportional to a noise distribution in said optical signal and a second component proportional to the square of said noise distribution.

26. (New) The method of claim 20, wherein said non-Gaussian noise is substantially described by a first component linearly proportional to a noise distribution in said optical signal and a second component proportional to the square of said noise distribution.